

Message Text

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ORIGIN EB-07

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C O N F I D E N T I A L STATE 276517

EXCON

E.O. 11652: XGDS-1

TAGS: ESTC, COCOM

SUBJECT: COCOM LIST REVIEW: IL 1355, SEMICONDUCTOR
MANUFACTURING AND TEST EQUIPMENT

1. USDEL SHOULD SUBMIT FOLLOWING AS REVISION OF US
PROPOSAL OF SUB-ITEM (B) OF SUBJECT ITEM:

(B) ...

(1) EQUIPMENT FOR THE MANUFACTURE OF EMBARGOED SEMICONDUCTOR
DEVICES AS FOLLOWS:

(I) EQUIPMENT FOR POLISHING SEMICONDUCTOR MATERIAL
WITH MULTIPLE BLOCKS AND EMPLOYING VACUUM CHUCKS AND/OR
TEMPERATURE CONTROL.

(II) EQUIPMENT DESIGNED FOR AUTOMATIC PHYSICAL OR
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CHEMICAL SURFACE CLEANING OF SLICES OF SEMICONDUCTOR

MATERIALS.

(III) EQUIPMENT, FULLY OR PARTIALLY PROGRAMMABLE FOR THE DEPOSITION OF EPITAXIAL MATERIAL.

(IV) MACHINES FOR ETCHING DIELECTRICS, SEMICONDUCTOR MATERIALS OR METALS USING WET OR DRY METHODS.

(V) FURNACES OR GAS SYSTEMS FOR THERMAL PROCESSING OF SEMICONDUCTOR MATERIAL AND SPECIALLY DESIGNED PARTS AND COMPONENTS, WITH ANY OF THE FOLLOWING CHARACTERISTICS:

(A) CAPABLE OF FULLY OR PARTIALLY PROGRAMMED CONTROL OF TEMPERATURE, POWER OUTPUT, GAS FLOW OR MECHANIZED LOADING AND UNLOADING.

(B) CAPABILITY OF PRODUCING THERMAL FLAT ZONES OF PLUS OR MINUS 0.5 DEGREE C. OVER 20 INCHES (510 MM) OR LONGER WITH A PROCESS TUBE DIAMETER OF 3.5 INCHES (90 MM) OR GREATER AT TEMPERATURES ABOVE 600 DEGREES C. (ORIGINAL PARA (B) DELETED)

(VI) EQUIPMENT DESIGNED FOR DEPOSITION OF DIELECTRIC OR METAL FILMS USED IN SEMICONDUCTOR DEVICES, EXCEPT METAL FILAMENT EVAPORATION SYSTEMS.

(VII) (ORIGINAL PARA (VII) DELETED)
ELECTRON BEAM SYSTEMS FOR SEMICONDUCTOR DEVICE PROCESSING OTHER THAN DEPOSITION SYSTEMS AND SPECIALLY DESIGNED PARTS AND COMPONENTS WHICH HAVE ANY OF THE FOLLOWING CHARACTERISTICS:

(A) BEAM CURRENT GREATER THAN 10 TO THE MINUS 8 AMPERES WITH A BEAM PROBE DIAMETER OF 1 MICROMETER OR LESS;

(B) ACCELERATION VOLTAGE LESS THAN 50,000 VOLTS;

(C) COMPUTER CONTROL OR COMPUTER INTERFACE CAPABILITY.

(VIII) EQUIPMENT FOR THE LASER MODIFICATION OF DIELECTRICS, SEMICONDUCTORS OR METALS.
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(2) TESTING AND/OR SORTING

(I) EQUIPMENT FOR AUTOMATIC OR SEMI-AUTOMATIC MEASUREMENT OF DIELECTRIC, SEMICONDUCTOR OR METAL MATERIAL PARAMETERS.

(II) AUTOMATIC OR SEMIAUTOMATIC SLICE INSPECTION STATIONS AND HANDLING EQUIPMENT.

(III) AUTOMATIC OR SEMIAUTOMATIC WAFER PROBES WITH SLICE CAPABILITY GREATER THAN 2 INCHES (50 MM) OR CAPABILITY OF PROVIDING DIE LOCATION DURING TEST.

(IV) AUTOMATIC OR SEMIAUTOMATIC SCRIBING EQUIPMENT AND SPECIALLY DESIGNED PARTS AND COMPONENTS, AS FOLLOWS:

(A) LASER SCRIBING

(B) DIAMOND SCRIBING AND/OR SAWING WITH A SLICE CAPABILITY OF OVER 2 INCHES (50 MM).

(V) EQUIPMENT DESIGNED FOR TESTING DISCRETE SEMICONDUCTOR DEVICES AND COMPONENTS INCORPORATING ANY OF THE FOLLOWING CHARACTERISTICS:

(A) CAPABILITY TO SUPPLY A CURRENT GREATER THAN 20 AMPERES;

(B) CAPABILITY TO APPLY A VOLTAGE GREATER THAN 1200 VOLTS BETWEEN ANY TWO LEADS;

(C) CAPABILITY TO SUPPLY AN INSTANTANEOUS PEAK POWER OF GREATER THAN 300 WATTS;

(D) CAPABILITY TO MEASURE TIME INTERVALS LESS THAN 30 NANOSECONDS;

(E) CAPABILITY TO MEASURE FREQUENCY DEPENDENT PARAMETERS AT FREQUENCIES HIGHER THAN 30 MHZ;

(F) CAPABILITY TO RESOLVE CURRENTS OF LESS THAN 100 PICOAMPERES; OR
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(G) CAPABILITY TO MEASURE SPECTRAL RESPONSE OR WAVELENGTH OF LIGHT-EMITTING DEVICES OR THE CAPABILITY TO MEASURE LIGHT INTENSITY OUTSIDE THE VISIBLE SPECTRUM.

(H) CAPABILITY TO BE PROGRAMMED AND/OR COMPUTER CONTROLLED.

NOTE: DISCRETE SEMICONDUCTOR DEVICES INCLUDE DIODES, TRANSISTORS, THYRISTORS, PHOTOCELLS AND SOLAR CELLS.

(VI) EQUIPMENT CAPABLE OF TESTING SEMICONDUCTOR MICRO-CIRCUITS (MONOLITHIC INTEGRATED CIRCUITS, MULTICHIP, HYBRID, FILM-TYPE, FILM-TYPE MICROCIRCUITS, AND CIRCUIT ASSEMBLIES) AND SPECIALLY DESIGNED PARTS AND COMPONENTS INCORPORATING ANY OF THE FOLLOWING CHARACTERISTICS:

(A) ANY CAPABILITY LISTED UNDER (V) EXCEPT (F) AND
(G) FOR DISCRETE SEMICONDUCTOR DEVICE TEST EQUIPMENT;

(B) CAPABILITY OF PERFORMING FUNCTIONAL (TRUTH-TABLE)
TESTING AT A PATTERN RATE GREATER THAN 500 KHZ;

(C) VOLTAGE RESOLUTION CAPABILITY OF 5 MILLIVOLTS OR
LESS;

(D) CURRENT RESOLUTION CAPABILITY OF LESS THAN 1
NANOAMPERE;

(E) CAPABILITY OF TESTING LINEAR INTEGRATED CIRCUITS
THAT ARE RESTRICTED UNDER CURRENT EXPORT ADMINISTRATION
REGULATIONS;

(F) CAPABILITY OF TESTING SINGLE PACKAGED DEVICES
HAVING MORE THAN A TOTAL OF 16 TERMINALS.

(3) BONDERS AND WELDERS

(I) AUTOMATIC OR SEMIAUTOMATIC BONDERS OR WELDERS,
INCLUDING DIE MOUNTERS, THERMOCOMPRESSSION BONDERS, AND
ULTRASONIC BONDERS;

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(II) EQUIPMENT CAPABLE OF PRODUCING MULTIPLE BONDS IN
A SINGLE OPERATION (E.G., BEAM LEAD BONDERS, WOBBLE
BONDERS, ETC.);

(III) SPECIALLY DESIGNED PARTS AND COMPONENTS FOR THE
ABOVE EQUIPMENT.

(4) MASKS

(I) FINISHED PHOTOMASKS AND PHOTOMASK ARTWORK.

(II) HARD SURFACE (E.G., CHROMIUM, SILICON, IRON OXIDE,
ETC.) COATED FLAT GLASS SUBSTRATES FOR THE PREPARATION
OF MASKS IN (I) ABOVE.

(5) INSULATING SUBSTRATE

(I) PHOTOMASK FABRICATION MACHINES AS FOLLOWS:

(A) STEP AND REPEAT CAMERAS CAPABLE OF PRODUCING ARRAYS
LARGER THAN 2.5 BY 2.5 INCHES (65 BY 65 MM) AND/OR A
SINGLE EXPOSURE LARGER THAN 150 BY 150 MILS (4.0 BY 4.0

MM);

(B) PATTERN GENERATORS SPECIALLY DESIGNED FOR THE GENERATION AND/OR MANUFACTURE OF MASKS OR THE CREATION OF PHOTSENSITIVE PATTERNS ON THE SURFACES OF SEMI-CONDUCTOR OR INSULATING SUBSTRATES;

(C) PROGRAMMABLE FLATBED PLOTTERS WITH A PLOTTING AREA OF 400 SQ. IN. (2600 SQ. CM.) OR GREATER AND A RESOLUTION OF 5 MILS (0.127 MM) OR LESS IN THE X,Y MOTIONS AND A PROPORTIONAL RESOLUTION FOR LARGER SIZE PLOTTING AREAS.

(D) DIGITIZERS WITH A WORKING AREA OF 400 SQ INCHES (2600 SQ CM) AND A RESOLUTION OF 2.5 MILS (65 MICRONS) OR LESS AND A PROPORTIONAL RESOLUTION FOR LARGER AREAS.

(II) EQUIPMENT FOR COMPUTER-AIDED CIRCUIT OR ARTWORK DESIGN AND FOR CONVERSION OF CIRCUIT DESIGNS TO DIGITAL DATA FOR ARTWORK PREPARATION;
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(III) MASK CONTACT PRINTERS CAPABLE OF PRODUCING ARRAYS OR IMAGES LARGER THAN 2.5 BY 2.5 INCHES (65 MM BY 65 MM);

(IV) INSPECTION MACHINES AS FOLLOWS:

(A) CAPABLE OF COMPARISON OF OVERLAY REGISTRATION TO A PRECISION OF 0.75 MICROMETER OR BETTER OVER AN AREA OF 2.5 BY 2.5 INCHES (65 BY 65 MM) OR GREATER;

(B) AUTOMATIC OR SEMIAUTOMATIC AND CAPABLE OF RESOLUTION OF 0.25 MICROMETER OR LESS AND ACCURACY AND PRECISION OF 0.75 MICROMETER OVER A DISTANCE IN SINGLE OR TWO COORDINATES, 2.5 INCHES (65 MM) OR GREATER;

(C) AUTOMATIC OR SEMIAUTOMATIC DEFECT INSPECTION SYSTEMS.

(V) AUTOMATIC OR SEMIAUTOMATIC PHOTORESIST PROCESSING SYSTEMS USING EITHER DRY OR WET CHEMICAL METHODS;

(VI) AUTOMATIC OR SEMIAUTOMATIC ALIGN AND EXPOSE EQUIPMENT;

(VII) ALIGN AND EXPOSE EQUIPMENT CAPABLE OF PRODUCING USEFUL PATTERN SIZE LESS THAN 5 MICROMETERS AND ALIGNMENT PRECISION BETTER THAN 1 MICROMETER AND COVERING A FIELD OF 3 INCHES (75 MM) DIAMETER OR GREATER;

(VIII) NONCONTACTING IMAGE TRANSFER EQUIPMENT CAPABLE OF

PROCESSING SLICES GREATER THAN 2 INCHES (50 MM) DIAMETER;

(IX) ELECTRON BEAM SYSTEMS AND SPECIALLY DESIGNED PARTS
AND COMPONENTS HAVING PROJECTION PRINTING CAPABILITY.

(X) EQUIPMENT FOR THE REMOVAL OF DEFECTS IN PHOTOMASKS
OR PHOTOMASK MASTERS.

2. ADD SUB-ITEM (B)(6) AND THE NOTES AS IN US
SECOND ROUND PROPOSAL (COCOM DOC REV (74)1355/2).

3. AS RETREAT POSITION USDEL AUTHORIZED ACCEPT DELETION
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FROM ABOVE OF (B)(1)(I) ON POLISHING EQUIPMENT, OMISSION
OF DIAMOND SCRIBING FROM (B)(2)(IV)(B) AND DELETION OF
(B)(5)(IV) ON MASK CONTACT PRINTERS. STEENBERGEN HAS
AUTHORITY MAKE OTHER CHANGES TO MEET POSITIONS OTHER
DELEGATIONS IN (B)(1)(II), (B)(2)(IV) AND (B)(5)(I)(C)
ON AD REF BASIS.

4. IN DISCUSSIONS USDEL SHOULD MAKE CLEAR THAT SUB-ITEM
(B)(2) ALSO COVERS DICING, SCRIBING AND PROBING EQUIPMENT
BUT DOES NOT COVER SLICING, SLICE BREAKING, AND
HANDLING (E.G. VIBRATION SORTERS, CONVEYOR CHUTES, ETC.)
EQUIPMENT.

5. DELETE SUB-ITEM (C) OF PRESENT DEFINITION. (THIS
WAS PART OF U.S. ROUND TWO POSITION BUT WAS NOT MADE
CLEAR IN US PRESENTATION.)

6. BEGIN FYI: ABOVE IS DEFENSE POSITION WHICH HAS BEEN
AGREED FOR PRESENTATION BUT WITH RESERVATIONS ON SOME
POINTS BY CERTAIN OTHER AGENCIES. IT IS THEREFORE
POSSIBLE THAT FURTHER INTER-AGENCY DISCUSSIONS COULD
RESULT IN SOME MODIFICATIONS. IT WOULD THEREFORE BE
ADVISABLE THAT DISCUSSION NOT BE CLOSED OUT DURING THIS
ROUND IF AGREEMENT NOT FULLY REACHED ON THE ABOVE. WE
WOULD BE PARTICULARLY INTERESTED IN ANY RECOMMENDATIONS
FROM USDEL AND WASHINGTON TEAM ON MODIFICATIONS THAT
WOULD MAKE PROPOSAL ACCEPTABLE TO OTHER PC'S. KISSINGER

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Message Attributes

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